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Wage and Price Setting in Macedonia: Evidence from Survey Data

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Abstract: This paper presents the main findings of a survey on wage and price formation of firms in Macedonia conducted in the first half of 2014. The main objective was to identify some relevant characteristics about the dynamics of wages and prices in Macedonia, clarifying the relationship between them, and to draw some conclusions on firms' response to various adverse shocks in adjusting labour costs, prices and their various components. The most important conclusions are that: i) wages tend to remain unchanged longer than prices; ii) the most significant factor producing frequent wage adjustment is tenure rather than inflation; iii) time concentration of wage and price changes is significantly lower in Macedonia than in the surveyed EU countries as a result of the considerably low automatic indexation of wages and large share of firms that operate in highly price competitive pressures; iv) downward nominal wage rigidity could be considered relatively high associated with the extent of permanent contracts, and is more important compared to the low downward real wage rigidity; v) there is a weak price-wage link which corresponds with inflation being the least important factor driving wage changes; and vi) in case of adverse shocks firms tend to adjust costs and prices rather than margins and output.

Key words: survey data, wage and price setting, wage rigidity, indexation, Macedonia

JEL classification: D21, E30, J31

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Table of Contents

1. Introduction

The appropriate design of economic policies in general and monetary policy in particular, requires deep understanding of the sources and features of wage and labour cost dynamics. For a small open economy like Macedonia with a fixed exchange rate regime and imperfect capital mobility, wage flexibility becomes an important requirement for providing an adequate adjustment to shocks. According to Yamaguchi (2005), one of the key determinants of the allocative efficiency of the labour market is wage flexibility, which is an important driver of overall labour market outcome, and if wages are flexible, the absorption of shocks or the adjustment to structural changes become easier, ensuring more accurate signals for labour reallocation.

In this paper, we summarize the results of a representative survey on wage and price setting mechanisms in Macedonian enterprises from the manufacturing, construction, trade and market services sectors. Analyses of survey results based on micro-level data are focused only at a descriptive level. We link and cross tabulate some answers of firms about wage and price setting with their sector, size, market competition, collective agreement, labour cost share, in order to explain some of the behaviour of firms related with their wage and price decisions.

The survey on wage and price setting behaviour at a firm level in Macedonia was conducted by the National Bank of the Republic of Macedonia for the first time in the first half of 2014, while in selected EU countries, the survey was carried out between the end of 2007 and the first half of 2008. The EU survey is part of the activities of the Wage Dynamics Network (WDN) that has two specific objectives. The first one is identifying the sources and features of wage and labour cost dynamics that are most relevant for monetary policy, while the second objective aims at clarifying the relationship between wages, labour costs and prices at both the firm and macro-economic level. The network consists of 23 central banks from the EU and is coordinated by the European Central Bank. The network developed the WDN Survey on wage and pricing policies at the firm level, which was carried out by 17 national central banks.

The findings for the EU, mentioned in the literature review section below, refer to firms' behaviour before the global economic crisis (a period of relatively stable growth and

moderate levels of inflation), while evidence for firms in Macedonia reflects firms' behaviour in a period of sluggish economic recovery from the global economic and financial crisis. Besides these differences in the observation periods, still, most of the findings for the surveyed EU countries can apply to Macedonia as well. Based on the information from the survey, this paper presents a number of stylised facts on wage and price dynamics in Macedonia, some of which are summarised below.

The results from the survey show that 29.4% of the firms in Macedonia are characterised by a low degree of wage indexation. At the same time, slightly more than half of the employees are covered by collective wage agreements, signed at a sector or firm level. The surveyed companies have a high labour cost share (41.2%), related to a high proportion of low skilled (blue-collar) workers. Wages of employees tend to remain unchanged on average for almost 16 months, which is somewhat longer, compared with the average wage duration in the surveyed EU countries (15 months). When wages change, tenure stands out as the most important factor producing wage adjustment. The frequency of wage changes driven by inflation is the lowest.

Analysing inflation and the price dynamics, prices tend to remain unchanged for 7 months due to high share of firms that experience severe or strong price competition. This implies that changes in wages occur less frequently than changes in prices, thus the average duration of wages is considerable 9 months longer than the average duration of prices.

Looking at the deeper relationship between the price and wage dynamics, (1) in Macedonia, the downward nominal wage rigidity is more important compared to downward real wage rigidity. This is true also for the surveyed non-euro area countries. Compared to the figures of surveyed EU firms, downward nominal wage rigidity is higher, while downward real wage rigidity is more modest in Macedonia. (2) The time dimension shows weak synchronisation between the timing of price and wage changes, with only 22% of firms recognising that a relationship does exist (40% in surveyed EU countries). The weak price-wage link in Macedonia corresponds with the results that inflation is the lowest important factor driving wage changes, which is striking difference from the EU, where inflation is the main driving factor of frequent changes in wages (though in both cases there is low-inflation environment). Although, the pass-through from wages to prices observed after an unexpected wage shock appears to be relevant for half of the surveyed firms in Macedonia.

The remaining part of the paper is structured in the following way. The literature review in Section 2 gives an overview of the consulted research papers that have dealt with the results from the WDN survey. Section 3 describes the survey design, providing information on the questionnaire, the sample of the survey and the way the survey was conducted, as well as a review of some of the firms' characteristics. Section 4 provides an overview of the survey results on the different aspects of wage and price rigidity, including frequency of wage and price changes, possible determinants of wage changes and their indexation, time concentration of wage changes, wages of new hires, downward wage rigidities and alternative measures of labour cost adjustment. Section 5 looks at the reaction of firms to different types of shocks with respect to unanticipated slowdown in demand, increase in intermediate input prices (e.g. oil price increase) and permanent increase in wages. Section 6 deals with the extent of price-wage link and pass-through of wage shock to prices. The different channels through which the crisis affected firms' activity are presented in Section 7. The closing section provides concluding remarks of the paper.

2. Literature overview

When writing this paper and analysing the survey results from the Macedonian firms, we have consulted research papers that have analysed WDN survey results from EU countries, as well as the Final Report of the Wage Dynamics Network which summarises the results of the network.

Druant et al. (2009) find that EU firms adjust wages less frequently than prices, where wages tend to remain unchanged for about 15 months on average, while prices are unchanged for around 10 months. Differences are more evident among the different sectors, where the authors find that prices set by business services firms are unchanged for 11 months, while prices of the trade sector and financial services are more flexible (unchanged for 7 and 8 months, respectively). Similarly, they find that in the construction sector wage duration is 13 months, while in the trade sector it is 15 months. With a multivariate analysis of the determinants of price rigidity, the authors find that at the firm level more frequent price adjustments are associated with higher intensity of competitive pressures and exposure to foreign markets, as well as with a lower share of labour costs on total costs. On the other side, besides on inflationary outlook, wage adjustments are dependent on each country's national institutional setting.

Babecky et al. (2009a) in their paper present the frequency of downward wage rigidity in both real and nominal terms in EU countries. The authors define downward nominal wage rigidity on the basis of the frequency of nominal wage freezes, thus, frozen wages are considered to be subject of nominal wage rigidity. Similarly, they define downward real wage rigidity on the basis of wage indexation, achieved with an automatic link to either past or expected inflation. Similar to Druant et al (2009), they find that country effects and institutional differences are significant determinants to downward wage rigidities. In addition, their results indicate that downward wage rigidity is related to workforce composition at the establishment level in a manner that is consistent with related theoretical models. Both types of rigidity are positively correlated with the share of high-skilled white-collars[2], meaning that firms employing a larger proportion of high-skilled white-collar workers are more likely to be subject to downward wage rigidities, both in real and nominal terms. Furthermore, their results reveal that wage rigidity also depends on the labour market institutional environment, while collective bargaining coverage is positively related with downward real wage rigidity, measured on the basis of wage indexation.

In another paper by Babecky et al. (2009b), they further investigate the wage rigidity in EU companies in terms of base wages, by examining six strategies firms use to cut labour costs. Namely, wage rigidity does not strictly imply rigid labour costs, as firms have other margins of adjustment of their labour costs, such as flexible pay components (bonuses or fringe benefits), re-organisation of production (change shifts), slow promotions of employees, or labour turnover (cheaper hires or early retirement) as a tool to adjust labour costs in economic activity. Therefore, they find that firms subject to some form of wage rigidity use alternative strategies of adjusting labour costs, and at the same time firms subject to nominal wage rigidities are much more likely to use each of the six cost-cutting strategies. Therefore, their results indicate a certain degree of substitutability between wage flexibility and other labour cost flexibility.

Similarly, Bertola et al. (2010) consider other aspects of reaction and adjustment of prices, wages and employment to the economic environment. Moreover, focusing on the pass-through of cost shocks to prices, they find that firms facing strong competition are less likely to increase prices and more likely to reduce costs after a wage shock, and the

[2] Classification of employees is made according to the International Standard Classification of Occupations (ISCO-08), where high-skilled white-collar workers are classified in ISCO categories 1,2 and 3 (Managers, Professionals, and Technicians and associate professionals), low-skilled white-collar are classified in ISCO categories 4 and 5 (Clerical support workers and Service and sales workers), high-skilled blue-collar are classified in ISCO categories 7 and 8 (Craft and related trades workers and Plant and machine operators, and assemblers), and low-skilled blue-collar are classified under ISCO category 9 (Elementary occupations).

presence of collective wage agreements (at industry or national level) makes the price increase more likely. Also, their results show that price increases are more likely in countries with a high degree of employment protection legislation.

3. Survey design

3.1. Survey questionnaire

The survey on wage and price formation in Macedonian enterprises uses the harmonised survey applied within the WDN project of the Eurosystem. The first section of the survey focuses on information on wage setting practices, on the frequency and timing of wage changes, as well as on wage setting practices of new workers relative to existing workers. The second section addresses the issues of downward wage adjustments and the adjustment (with respect to wages, prices, total costs, employment and margins) to different shocks. The third section of the survey is aimed at the price-setting behaviour of firms and on the frequency of price changes. The fourth section addresses the consequences of the economic and financial crises. The final, fifth, section of the survey acquires firm-specific data in regards to the period of operation of the company, the number of employees, age structure, their ages and skills, employee turnover, and the share of labour costs in total costs.

The survey design has implemented the survey questions from the first WDN survey for the EU (2007-2008 survey) together with the questions from the limited follow-up WDN survey of 2009. Additionally, the survey on wage and price formation in Macedonian enterprises includes a section regarding the consequences of the economic and financial crises, the business activity of firms during this period, as well as the benefits of the government's anti-crisis measures. The survey questionnaire was answered by senior management of the firms. The questions in the survey deal with firms' "normal conditions and practices" with the 2013 defined as a reference period. With the purpose of identifying the characteristics of wage, labour cost and price dynamics, and their interrelationships at the firm and macro-economic level, the survey included questions on the relevance of various decision strategies on price and wage adjustment, price stickiness, as well as on the speed of price adjustments after shocks.

3.2. Sample and implementation of the survey

The survey was conducted in the period February-May 2014, in the form of face-to-face interviews. The implementation of the survey was based on a representative sample of 514 enterprises (employing 32,932 employees) of four economic sectors: manufacturing, construction, trade and market services[3]. The survey covered firms employing from 1 to more than 250 employees. The following sectors of the statistical classification of economic activities (NACE REV.2) were targeted:

Manufacturing (activities 10-33);

Construction (activities 41-43);

Trade (activities 45-47);

Market services (activities 49-63 and 68-82).

The parameters of the total population of firms in the four sectors were based on official data from the State Statistical Office of the Republic of Macedonia (SSORM) as of end-2011. The composition of the total population of firms (by sector and firm size) is presented below (Table 3.1).

Table 3.1

Total Population of selected sectors: Number of active business entities by sectors of activity according to NACE Rev.
and by number of persons employed, 2011

	Number of persons employed					
Sector of activity	1-9	10-19	20-49	50-249	250 +	Total
Manufacturing	6,070	655	496	331	53	7,605
Construction	3,512	272	150	57	6	3,997
Trade	24,509	769	326	97	12	25,713
Market Services	16,425	697	312	113	32	17,579
Total	50,516	2,393	1,284	598	103	54,894

Source: SSO of RM.

Rev.2 ,
and by number of persons employed, 2011

	Number of persons employed					
Sector of activity	1-9	10-19	20-49	50-249	250 +	Total
Manufacturing	11.1	1.2	0.9	0.6	0.1	13.9
Construction	6.4	0.5	0.3	0.1	-	7.3
Trade	44.6	1.4	0.6	0.2	-	46.8
Market Services	29.9	1.3	0.6	0.2	0.1	32.0
Total	92.0	4.4	2.3	1.1	0.2	100.0

Source: SSO of RM.

[3] Companies that provide Market services under NACE Rev.2 are classified as companies performing the following activities: Transportation and storage, Accommodation and food service activities, Information and communication, Real estate activities, Professional, scientific and technical activities, and Administrative and support service activities.

The sample of 514 firms (targeted sample was 500) according to their activity is employment weighted by the number of employees that are employed in the population of 54,894 firms. For example, in the original category (from the SSO) of 1 to 9 persons employed, there are 109,166 employees (Table 3.2), or 35.7% of the surveyed population, which means the targeted sample of 500 firms would need to consist of 35.7% of firms which employ from 1 to 9 persons. Similarly, firms employing over 250 persons include 61,293 (or roughly 20%) of the 305,992 employees in the four sectors. Meaning, the targeted sample of 500 firms would need to survey 100 firms that employ over 250 employees (or almost the whole population of 103 active business entities as of end of 2011). Therefore, in constructing the survey (assuming a 30% response rate), this category was reduced to a targeted sample of at least 30 large firms and the remainder of 70 firms would be distributed among the rest of the 4 size categories (according to their proportional weights in the targeted sample).

After the survey was carried out, the final sample in the survey includes 161 manufacturing firms, 49 construction firms, 164 firms from the trade sector, and 140 firms from the business services sector. Since the grouping categories from the SSO on the size of the firm (according to number of employees) was not comparable with the grouping categories from the WDN surveys, the grouping according to size of the firm was accordingly adjusted after the survey was carried out (Table 3.3). Therefore, the size of the firm, according to number of persons employed, is divided in the following 5 categories: from 1-4 employees, 5-19 employees, 20-49 employees, 50-199 employees, and 200+ employees. In terms of firm size, small companies (with less than 20 employees) dominate the sample, accounting for 54 percent of all firms, while only 8 percent of surveyed firms employ more than 200 employees. The total number of employees covered in the sample is 32,932, with 48.7% of them in manufacturing, 24.6% in market services, 14% in trade, and 12.8% in construction. In the analysis presented in the paper, the results are employment-weighted (employment in the firm relative to the total number of employees in the sample) so as to ensure that a higher weight is given to the larger firms, as their decisions on wage and price-setting are more important for the economy[4]. Non-responses are excluded.

[4] Employment-weighted results are also reported for the countries that participated in the WDN survey which allows comparison of results.

Table 3.2

Number of Employees by sectors of activity according to NACE Rev.2 ,
and by number of persons employed, 2011

Sector of activity	*Number of persons employed*					
	1-9	10-19	20-49	50-249	250 +	Total
Manufacturing	13,671	8,509	15,157	38,360	26,605	102,302
Construction	7,538	3,544	4,792	6,085	5,664	27,623
Trade	50,940	10,393	9,947	9,114	7,910	88,303
Market Services	37,017	9,652	8,934	11,047	21,114	87,764
Total	109,166	32,098	38,830	64,606	61,293	305,992

Source: SSO of RM.

Table 3.3

Sample size: Number of business entities by sectors of activity according to NACE Rev.2 ,
and by number of persons employed

Sector of activity	*Number of persons employed*					
	1-4	5-19	20-49	50-199	200+	Total
Manufacturing	12	32	30	64	23	161
Construction	7	14	10	15	3	49
Trade	51	72	19	18	4	164
Market Services	25	67	17	20	11	140
Total	95	185	76	117	41	514

Sample size: Percent of business entities by sectors of activity according to NACE Rev.2 ,
and by number of persons employed

Sector of activity	*Number of persons employed*					
	1-4	5-19	20-49	50-199	200+	Total
Manufacturing	2.3	6.2	5.8	12.5	4.5	31.3
Construction	1.4	2.7	1.9	2.9	0.6	9.5
Trade	9.9	14.0	3.7	3.5	0.8	31.9
Market Services	4.9	13.0	3.3	3.9	2.1	27.2
Total	18.5	36.0	14.8	22.8	8.0	100.0

Source: Survey on wage and price setting in Macedonia (2014).

3.3. Main features of the surveyed firms

The survey results provide answers to the sets of questions regarding the firms' characteristics and institutional settings (Table 3.4), such as labour compensation practices and market competition, in which they operate. In terms of labour composition, most of the employees fall into the category of low-skilled (blue-collar) employees (45%). Manufacturing is an economic sector with largest share of blue-collar employees (60% of the employees are low-skilled blue-collar workers). On the other hand, the number of high-skilled white-collar employees is only 12.7% in the whole sample, with market services being the economic sector with largest share of white-collar workers (19%).

The survey questionnaire analyses specifically the practice of adjusting wages to prices. The survey results reveal that 29.4% of the Macedonian firms surveyed have a policy for adjusting wages to inflation, while the respective share from the survey of WDN EU countries is 35%. Inflation indexation is more widespread in the construction sector (49%), with manufacturing sector and trade sector (33% and 29%, respectively) dominating the services sector (13%).

The compensation of workers is then further examined from different aspects in the survey, in terms of the compensation practices they apply, the flexible wage share and the coverage of collective wage agreements of their employees. Regarding the first aspect, the most common practice in all sectors is the practice of paying monthly base wages. Slightly over a quarter of the firms use hourly based remuneration, while one fifth of the firms use piece-rate remuneration as the main form of employee compensation. In the manufacturing sector, the distribution of remuneration practices is more evenly spread out among the firms, while in the other three sectors there is a significant difference in favour of monthly-based wages.

Regarding the flexible wage share, firms provided information on the share of performance-related benefits as a percent of the total wage bill. Results of the survey show that the benefits are rather important as a form of compensation. Almost two thirds of the firms use flexible wage components (performance-related bonuses) which account for 19.3% of the total wage bill of the surveyed firms. The highest share of wages paid through performance-related bonuses is observed in the manufacturing sector (70.6% of firms), followed by the market services and trade sector (around 67%), while the construction sector has the least share (34.5% of the firms).

The third aspect of the labour compensation is the coverage of collective wage agreements, which influences firms' wage-setting behaviour. In the surveyed firms, more than half of the employees (53.5%) are covered by a collective wage agreement (either at the firm level, or outside the firm level), which represents moderate coverage. However, the effective negotiation power of Macedonian trade unions is weak and corresponds with the World Bank difficulty of redundancy index, which confirms the relatively loose employment protection in Macedonia (WB, 2011). Among the different sectors, the construction sector has the lowest coverage rate, i.e. 31% of the employees are covered by a collective wage agreement, while the highest coverage of 65% of employees appears in

the manufacturing sector. With respect to the firms, 38.2% percent of all firms surveyed apply collective pay agreements signed at the firm level, while collective pay agreements signed outside the firm is slightly less present (36.3 %). Analysed individually at the firm level or outside the firm level, the coverage by a collective wage agreement is relatively low. Therefore with the wage bargaining process being decentralised and thus predominantly organised at the firm level, this explains the low level of wage indexation to inflation (at around 30%), which is in line with the findings of the WDN survey, where in 17 countries, the wage indexation was implemented by one-third of the firms (WDN Final Report, 2009).

Having in mind the price dynamics in an international setting, the survey questionnaire also covers the competitive pressures faced by the Macedonian firms. The survey reveals that exporting manufacturing firms generate the highest share of their revenue (69%) from exports[5], followed by exporting firms in the services sector (23%), while revenues from exports of the construction and trade firms are in the single digit territory. As a response to competitive pressures (both domestic and foreign), 72.4% of firms are very likely, or likely, to reduce prices when their main competitor does so. This strategy is implemented the most by the construction sector (86%), followed by the trade sector (79%), manufacturing sector (71%), and it is least used in the services sector (65%).

[5] The share of exports in total sales among the exporting firms could be used as an indicator of the degree of competitive pressures and of the international exposure of the firms (Druant et al., 2009).

Table 3.4

Selected indicators of the surveyed firms (in percent)

Sector of activity	Manufacturing	Construction	Trade	Market Services	***Total***
Share of firms that have a policy that adapts changes in base wages to inflation					
Wage changes are automatically linked to past inflation	1.3		7.3	1.8	***2.2***
Wage changes are automatically linked to expected inflation	1.0		0.3	0.0	***0.5***
Although there is no formal rule, wage changes take into account past inflation	23.4	49.0	20.3	10.7	***23.0***
Although there is no formal rule, wage changes take into account expected inflation	7.3		0.9	0.5	***3.7***
Share of firms that don't have a policy that adapts changes in base wages to inflation	67.0	51.0	71.0	87.0	***70.6***
Application of collective pay agreements					
Share of firms applying collective pay agreements signed outside the firm	48.0	25.0	17.0	31.0	***36.3***
Share of firms applying collective pay agreements signed at the firm level	42.0	28.0	45.0	33.0	***38.2***
Share of employees covered by collective pay agreements	65.0	31.0	45.0	47.0	***53.5***
Employees by occupational group					
Low skilled blue collar/Production	60.0	37.0	36.0	24.0	***44.9***
High skilled blue collar/Technical	18.0	22.0	20.0	8.0	***16.3***
Low skilled white collar/Clerical	9.0	27.0	25.0	44.0	***22.2***
High skilled white collar/Professional	8.0	14.0	17.0	19.0	***12.7***
Use of performance related bonuses					
Share of firms that pay bonuses	70.6	34.5	66.9	67.7	***64.8***
Percentage of total wage bill to individual or company performance related bonuses	18.2	12.6	19.0	25.0	***19.3***
Competitive pressure					
Share of firms likely or very likely to follow price reductions of the main competitor	71.0	86.0	79.0	65.0	***72.4***
Share of firms exporting	71.4	16.3	17.1	45.0	***41.6***
Share of revenues generated due to sales in foreign markets	69.0	9.0	6.0	23.0	***41.1***
Labor compensation principles					
Hourly base wage	28.0	36.0	28.0	19.0	***26.6***
Piece-rate base wage	37.0	4.0	0.0	0.0	***18.7***
Monthly base wage {or other period-specific wage}	34.0	60.0	71.0	80.0	***53.7***
Share of firms total costs due to labour costs in the reference period	**42.0**	**20.0**	**31.0**	**56.0**	***41.2***

Source: Survey on wage and price setting in Macedonia (2014).

4. Features of wage setting and price duration

This section reviews the survey results on the features of wage setting and price duration, including: (4.1) frequency of wage and price changes, (4.2) time dependence and synchronisation of wage changes, (4.3) prevalence and features of indexation and adjustments of wages to inflation, (4.4) wage setting of new hires, (4.5) downward wage rigidity, and (4.6) alternative measures in adjusting labour costs.

4.1. *Frequency of wage and price changes*

The frequency of wage changes provides an indication of the degree of wage stickiness, which is an important parameter for macroeconomic analyses. The survey delivers information on the frequency of both wage and price changes at the firm level. The frequency of wage change is analysed through three different aspects: the wage changes stemming from moves in inflation, changes deriving from tenure and those related to other factors. Using these three aspects, one composite measure (following the approach of Martins (2011)) was calculated, defined as the highest frequency of wage change for each firm, irrespective of the specific determining factor.

The finding derived from the surveyed firms is that wages are adjusted less frequently. Results show that around 85% of the base wages of workers are changed once per year or less often, while only 15% of wages change more often (see Figure 4.1). When analyzing the frequency of price changes, the survey shows that in general firms change prices more frequently than they change wages. Only 34% of firms report that they change prices once a year or less frequently, 30% do it more often, while 36% do not have a particular pattern.

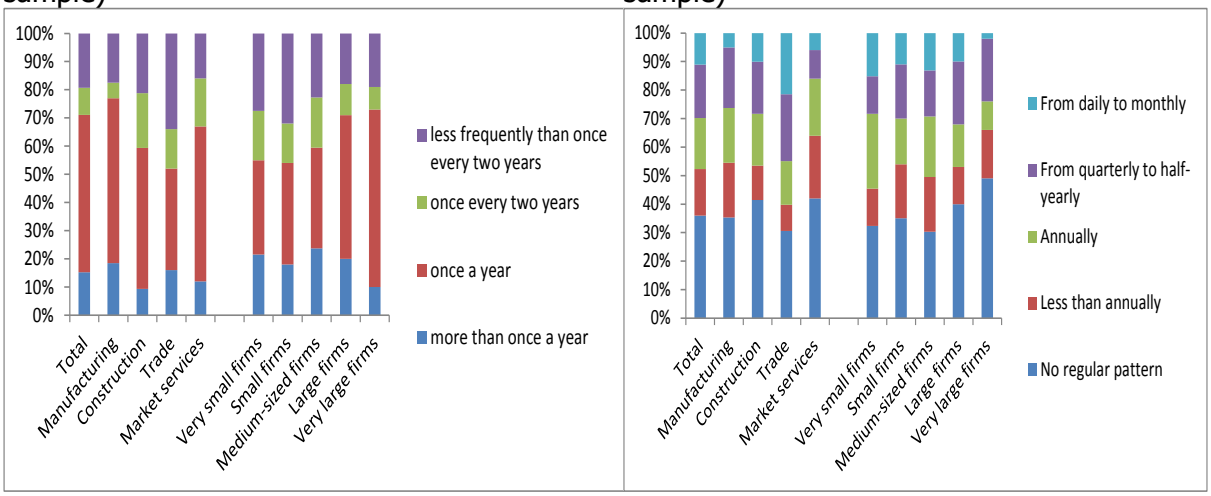
The analysis by sector reveals that there is some variation across sectors in the adjustment frequency of workers base wage. Wage changes are least frequent in construction and market services, more frequent in trade and most frequent in manufacturing sector. However, even in manufacturing, the base wages of around 59% of workers are adjusted with a yearly frequency and only 19% are adjusted with a higher frequency.

As regards to prices, firms in trade sector adjust prices much frequently than those in manufacturing, market services and construction. Construction and market services are sectors with the highest fraction of firms reporting no regular time-dependent pattern in price adjustments.

Figure 4.1

Frequency of wage changes
(as a percentage of total employment in the sample)

Frequency of price changes
(as a percentage of total firms in the sample)



Source: Survey on wage and price setting in Macedonia (2014).

In order to simplify the comparison, in Table 4.1 we report similar information on the flexibility of wage and price changes, but now, in terms of number of months for which they remain unchanged ("duration"). Following the approach of Martins (2011), a composite measure for the average duration of wage and price spells was computed. The computation is based on firms' answers to questions regarding the frequency of wage and price changes and by simply multiplying each point category by its respective frequency. Most answers were directly translated into durations (e.g. "once a year" translates to duration of 12 months), while for those categories expressed through intervals, the mid-point was assumed[6].

Prices tend to remain unchanged on average for almost 7 months[7]. Looking at sectoral differences, our results reveal that prices set by manufacturers and services firms tend to remain unchanged on average for almost 8 months, whereas those set in trade and construction are more flexible (with duration up to 5 and 6 months, respectively). When comparing with other EU countries as a part of WDN, average price duration in Macedonia is shorter which can be attributed to the high share of firms that experience severe or strong competition and follow competitor's price changes (as described in section 3).

[6] Druant et al. (2009) use other more complex distribution-based technique to assess the robustness of these durations for EU countries. They show that the results vary somewhat with the distributional assumptions, and conclude that those differences were qualitatively of minor significance.

[7] Firms that answered that they have no regular pattern of changing the price of their main product (about 36% of firms) are excluded from the calculation.

As expected, durations are longer for wages, as they remain unchanged on average for almost 16 months. There is evidence of some variation across sectors, but when looking to firms' size, the variation becomes smaller. Average wage duration is somewhat longer in Macedonia than in other EU countries, as a result of lower formal or informal indexation scheme to inflation and still moderate coverage in sector or firm-level collective wage agreement.

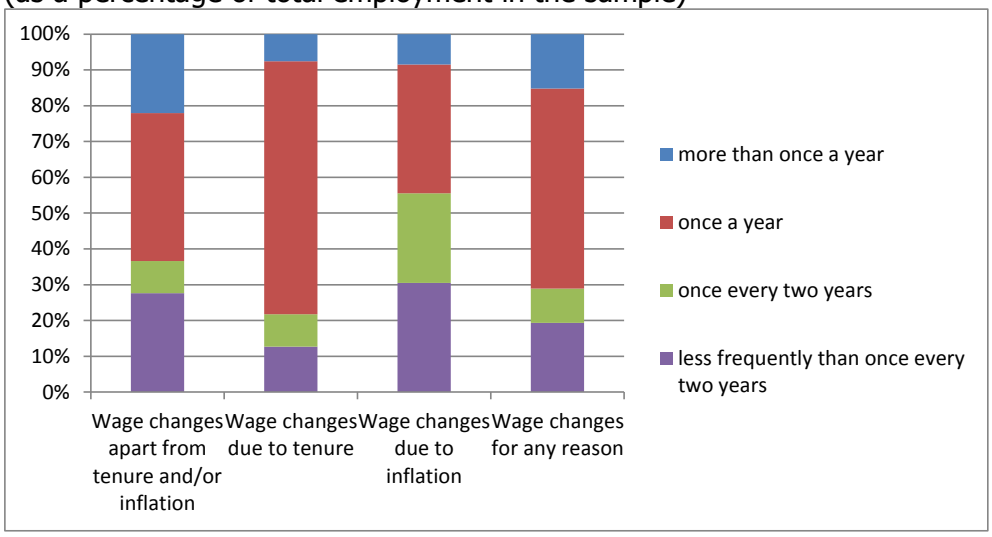
Table 4.1
Average duration of wage and price spells (in months)

	Wage duration	Price duration
Total	15.8	6.6
Manufacturing	14.8	7.3
Construction	20.9	5.8
Trade	19.0	4.6
Market services	16.3	8.0
Very small firms	17.9	6.3
Small firms	18.5	7.2
Medium-sized firms	16.9	7.4
Large firms	15.5	5.5
Very large firms	15.9	5.5
Memo:		
Total EU	15.0	9.6
Euro area	14.7	9.6
Non-Euro area	15.1	9.6

Source: Survey on wage and price setting in Macedonia (2014).

As for the reasons driving wage changes, when asking firms about the frequency of wage changes due to inflation, tenure or other sources, it is remarkable that tenure stands out as the most important factor producing frequent wage adjustment (on an annual or infra annual basis). The frequency of wage changes driven due to inflation is the lowest (see Figure 4.2). These results are somewhat different from the WDN Final Report results for the surveyed EU countries where inflation is the most important factor driving the frequent wage adjustment for the most EU countries. One possible explanation for this is the relatively low share of firms applying wage indexation in Macedonia compared to the surveyed firms in the EU. Survey results regarding indexation and adjustment of wages to inflation will be presented in detail in section 4.3.

Figure 4.2
Factors affecting the frequency of wage changes
(as a percentage of total employment in the sample)



Source: Survey on wage and price setting in Macedonia (2014).

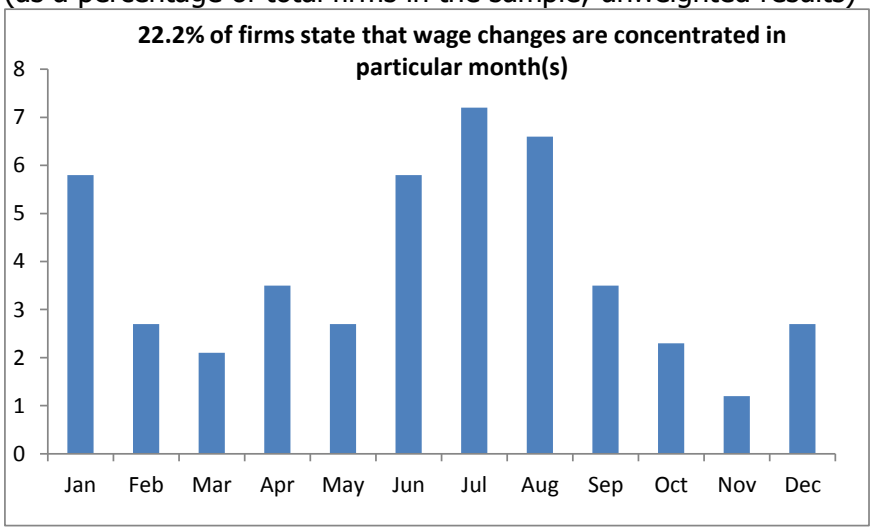
4.2. *Time dependence and synchronisation of wage changes*

Another relevant aspect of nominal wage rigidities, apart from the frequency of wage changes, is the timing of wage adjustments. In order to account for the fact that firms do not change wages in response to every shock, the literature has modelled firms' strategies either as a time-dependent process, where the timing of the adjustment of wages does not depend on the state of the economy, or as a state-dependent one when it does[8]. In the presence of shocks, time-dependent rules typically lead to greater wage rigidity.

As Figure 4.3 shows and having in mind the moderate incidence of collective bargaining and dominant use of firm-level collective agreements, the survey results suggest that there is weak regular pattern in the timing of wage changes in Macedonia. Indeed, only small fraction of the surveyed firms (22.2%) report that wage changes are concentrated in a specific month. This seems to be closer with non-euro area figures (34%), while it is far lower compared to the respective share (61%) of the euro area firms surveyed that adopt time-dependent wage rules. The low degree of concentration of wage changes can also be explained by considerable low automatic indexation of wages (more details in subsection 4.3) and by the fact that tenure is the main factor that drives wage changes which are assumed to occur throughout the year. Among the firms in Macedonia that declare such a "time-dependent" pattern, wage changes are mostly concentrated in June, July, August and January (Figure 4.3).

[8] It is not necessary that firms in case of positive/negative shock in economy increase/decrease wages of employees.

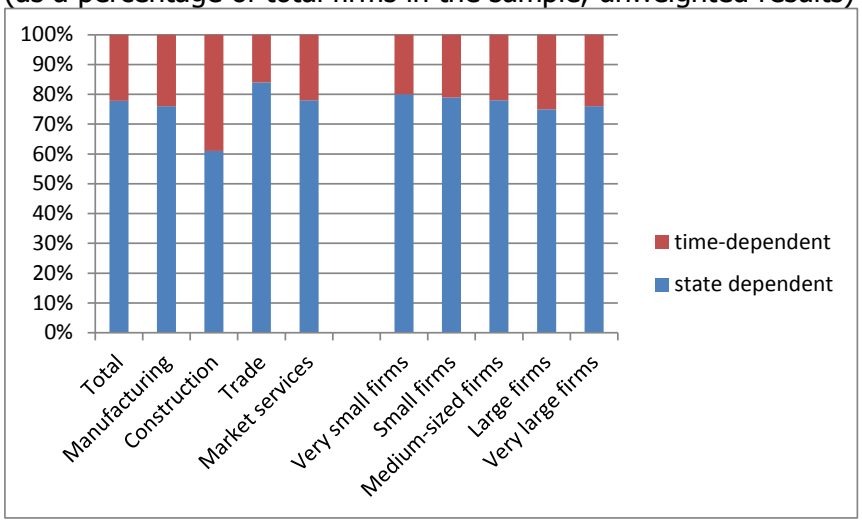
Figure 4.3
Concentration of wage setting decisions
(as a percentage of total firms in the sample; unweighted results)



Source: Survey on wage and price setting in Macedonia (2014). The sum of percentages exceeds the proportion of firms that change wages in specific months as they could choose more than one month.

The sectoral analysis shows that firms in construction sector tend to concentrate more often their wage decisions in a particular month compared with the firms from other sectors, while differences of wage concentration across firms' size seem to be negligible (Figure 4.4). Firms' operations in construction sector depend on seasonal factors, and their time concentration of wage decisions come exactly from seasonality, which particularly occur in the peak of construction works.

Figure 4.4
Wage-setting rules: time-dependent vs. state-dependent wage setting
(as a percentage of total firms in the sample, unweighted results)



Source: Survey on wage and price setting in Macedonia (2014).

4.3. *Indexation and adjustment of wages to inflation*

Survey on wage setting in Macedonia collected information on the prevalence of firm policies to adjust wages to inflation at the firm level. Firms were asked whether they have a policy that adapts changes in base wages to inflation or not. If so, firms were asked to report whether the adjustment is automatic or not, whether it is subject to a formal rule or not, and whether it refers to past or expected inflation. On average almost 30% of 514 firms surveyed do have an internal policy that adapts base wages to inflation, which put Macedonia in the group of countries with low level of indexation (EU is in the same group, with 37%) (Table 4.2). Of these 30%, nearly 91% has a policy that adapts wages to inflation (mostly based on past inflation) without applying any formal rule. The rest of them adopt an automatic indexation mechanism, mostly based on past inflation.

Firms' policies of adjusting base wages to inflation are somewhat less common in Macedonia, when compared with the surveyed firms in the EU countries. The differences are more evident in the mechanisms of indexation, where nearly half of EU surveyed firms that adapt base wages to inflation adopt an automatic indexation mechanism, and the other half has a policy that adapts wages to inflation with informal rule.

Table 4.2
Policy of adjusting base wages to inflation

Firm-level policy of adjusting base wages to inflation					
	Automatic		Informal		Total*
	Past	Expected	Past	Expected	
Total economy	2.2	0.5	23.0	3.7	29.4
Manufacturing	1.3	1.0	23.4	7.3	33.0
Construction	0.0	0.0	49.0	0.0	49.0
Trade	7.3	0.3	20.3	0.9	28.7
Market services	1.8	0.0	10.7	0.5	13.0
Very small firms	5.3	0.0	15.0	3.0	23.2
Small firms	6.8	0.8	15.3	2.3	25.0
Medium-sized firms	1.1	0.0	13.7	3.2	18.0
Large firms	2.6	1.3	23.4	5.6	33.0
Very large firms	1.5	0.0	24.9	2.6	29.0
Memo:					
Total EU	13.2	3.9	12.7	6.9	36.7
Euro area	16.3	4.1	9.7	5.5	35.6
Non-euro area	5.5	3.2	19.8	10.2	38.7

Figures weighted by employment weights. Source: Survey on wage and price setting in Macedonia (2014) and Druant, *et al.* (2009). (*) Percentage of workers covered by wage indexations clauses: Very low: 0-25%; Low: 26-50%; Moderate: 51-75%; High: 76-100% (Source: Du Caju *et al*, 2008.).

Looking across sectors, there is evidence of some variability, where firm's policies linking base wages to inflation are less common in market services and more widespread in

construction, which is in line with other EU countries. Predominant cases across each sector are the ones where the link of indexation of base wages to inflation is not formal and tends to be backward looking.

4.4. *Wages of newly hired workers*

In the previous section, we outlined that base wages of employees in Macedonia are somewhat rigid and less flexible. Having this in mind, it is very important to analyse the flexibility of wages of new hires, as it could serve as additional cost-cutting strategy to economic shocks. The literature has argued that wages offered to newly hired employees may respond differently to aggregate labour market conditions than those of employees in ongoing employment relationships. For example, Pissarides (2009) concludes that, on average, a one-percentage point rise in the unemployment rate is associated with a 3% decline in new workers' wages[9], whereas the corresponding elasticity for those in ongoing employment relationships is only about one-third of that.

In order to provide new evidence in that respect, the survey on wage setting in Macedonia includes a question asking firms about the most relevant factor in determining the entry wage of newly hired employees. In addition, firms are asked whether they would consider the existing conditions on the labour market (abundance or shortage of workers) when setting the wages of new workers.

The results from these questions suggest that the wage of newly hired workers follow the internal rather than the external pay structure of the firm or market conditions. In fact, as in most of the surveyed EU firms, around 89% of the surveyed firms report that internal factors, such as the collective agreement or the wages of similar employees in the firm, are the most important factors driving wages of newly hired employees (Table 4.3). Comparing the results with a sample of 12 EU countries presented in Galuscak et al. (2010), the difference can be noticed for the collective pay agreements factor, which is less significant factor for Macedonian firms when setting the wages of new employees. The possible explanation of this behaviour of surveyed firms in Macedonia can be the wage bargaining process, which is predominantly organised at the firm level rather than at sector or national level, as was observed in the previous section. The analysis across sectors shows negligible differences.

[9] Research paper of Pissarides covers findings for the USA and selected European countries.

Table 4.3
Importance of internal and external labour market conditions in wages of newly hired employees
(as per cent of employees in the sample)

	Collective pay agreement	Wages in the firm	Internal factors	Wages outside the firm	Labour supply	External factors	Total
Total	24.8	63.9	88.7	2.9	8	10.9	100
Manufacturing	35	50	85	4	11	15	100
Construction	7	85	92	3	4	7	100
Trade	22	69	91	4	6	10	100
Market services	16	77	93	1	5	6	100
Memo: EU	40.5	46	86.5	6.5	7	13.5	100

Source: Survey on wage and price setting in Macedonia (2014) and Galuscak et al. (2010).

The choice of internal factors (collective agreement or wages of similar employees) as more important factors driving wages of newly hired employees is explained with fairness considerations and the need to prevent a negative impact on effort. These two reasons are also more common in EU surveyed firms when they set-up similar wages for newly hired workers. In Macedonia, the concern that higher wages of new hires would inflict negative work effort on ongoing workers appears to be stated less frequently (13.7% of firms) as a reason preventing such practice, than in the surveyed EU countries (35.3% of the firms). The same concern is true with the lower wages of newly hired employees (Table 4.4).

Table 4.4
Reasons preventing different wage for new hires from incumbents

	Macedonia		EU	
	lower wage	higher wage	lower wage	higher wage
Unfair/bad reputation	38.9	49.8	32.9	39.2
Negative impact on effort	20.6	13.7	36.2	35.3
Labour regulation/Collective agreement	17.4	11.2	28.1	11.7
Unions would contest such action	0.4	-	1.6	-
Possible pressure for wage increases	-	2.3	-	13
Other	6.2	4.4	2.9	2.6

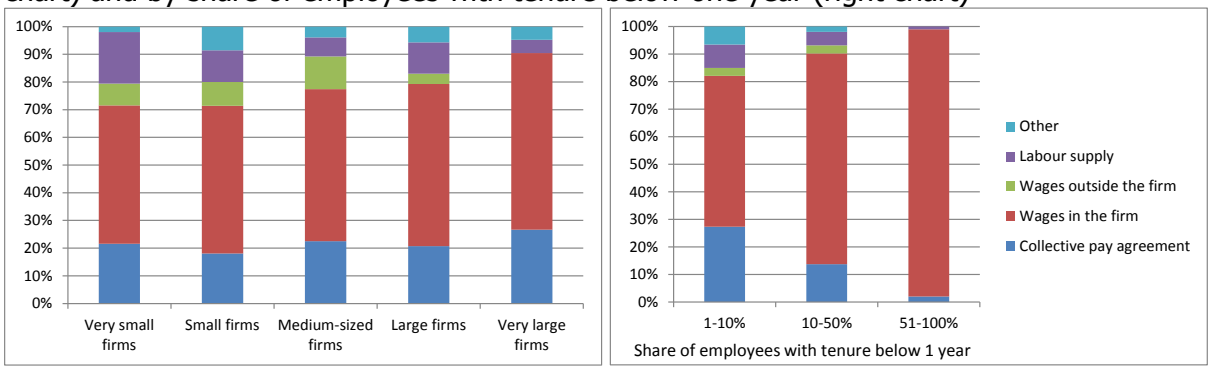
Source: Survey on wage and price setting in Macedonia (2014) and Galuscak et al. (2010).

When analysing data of internal and external labour market conditions in wages of newly hired employees by firms' size, we can attest that larger firms in Macedonia seem more likely to use internal benchmarks in determining wages of new hires. This is probably

because wage-setting mechanisms are more formalized in larger organizations (see Figure 4.5, left chart).

The Bewley (1999) hypothesis that external factors are used more often for wages of new hires in secondary jobs[10] is confirmed by the results from surveyed firms in the EU. Contrary to these findings, the results from the surveyed firms in Macedonia show that when the share of workers with tenure below one year is higher, firms do not consider at all external factors for wage setting of newly hired employees (see Figure 4.5, right chart).

Figure 4.5
Relevant factors in determining the entry wage of newly hired employees by firms' size (left chart) and by share of employees with tenure below one year (right chart)

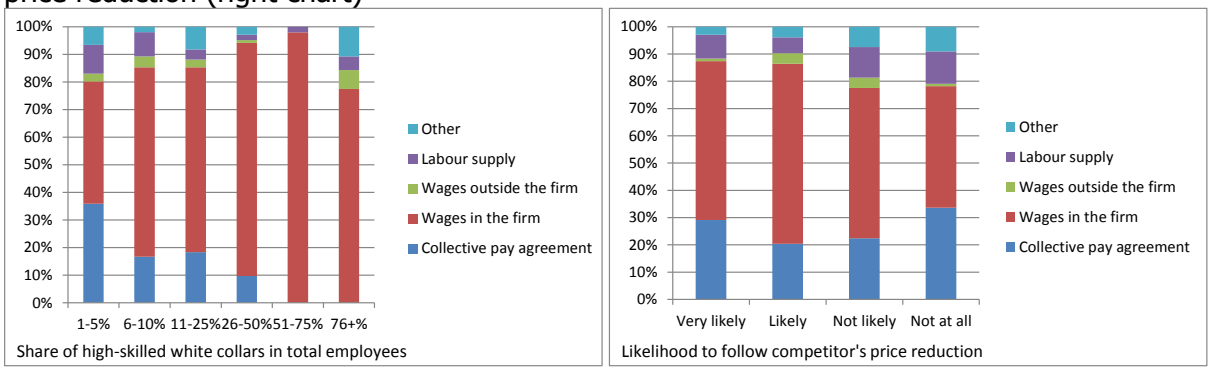


Source: Survey on wage and price setting in Macedonia (2014).

The composition of labour force and competitive pressures should also be considered when accounting for the practices of wage-setting of new hires in Macedonia. For example, surveyed firms with highest share of high-skilled workers appears to be associated with a higher dependence of wages of new hires on external factors, such as the abundance of job-seekers, and on wages prevailing on the market in Macedonia. Still, the internal pay structure for these firms remains the key factor in determining the wages of new hires (see Figure 4.6, left chart). Then, we look for practices of firms with different intensity of price competition in determining the wage of newly hired employees. In the survey, the intensity of price competition is gauged indirectly by the question that examines whether firms are likely to decrease prices if their main competitor decreases its own prices. Surveyed firms in Macedonia that answer positively to that question are deemed to face more competitive pressures, and at the same time, these firms determine the wages of new hires within their internal pay structure (Figure 4.6, right chart).

[10] Bewley (1999) distinguishes between primary and secondary jobs. Primary jobs are usually long-term and full-time, whereas secondary jobs are often short-term and part-time.

Figure 4.6
Relevant factors in determining the entry wage of newly hired employees by share of high-skilled white collars in total employees (left chart) and by likelihood to follow competitor's price reduction (right chart)



Source: Survey on wage and price setting in Macedonia (2014).

4.5 Downward wage rigidities

In line with the existing literature, two types of downward rigidity were considered in the survey questionnaire, nominal and real wage rigidity. Downward nominal wage rigidity relates to the inability of firms to implement (and, correspondingly, the reluctance of workers to accept) reductions in nominal wage rates. Similarly downward real wage rigidity reflects the inability of firms to increase wages at rates below the prevailing rate of inflation[11].

Following the pioneering work of Blinder and Choi (1990), Babecky et al. (2009*a*) present an alternative approach to assess nominal and real wage rigidity using WDN survey data. In their work, downward nominal wage rigidity is defined as the share of firms that state that they have frozen wages at least once in the past five years. The assumed hypothesis is similar to the one used by Dickens et al. (2007), who assumed that firms that freeze their workers' wage would, in the absence of nominal rigidity, be accepting a cut in wage. This hypothesis assumes, of course, that those firms that never froze their workers' wages over the five years prior to the survey do not consider the impossibility of reducing nominal wages as an active restriction. In relation to real rigidity of wages, Babecky et al. (2009*a*) consider the percentage of firms that accept the existence of an automatic connection between the variation of their wages and inflation (past or expected) as a measure.

[11] Obviously, in the case of zero inflation, the two concepts become indistinguishable.

The important evidence from the survey is that nominal wage cuts among Macedonian firms are relatively rare. The data show that around 12% of firms declared that wages were ever been cut during the previous five years. On the other hand, the percentage of firms that reported that wages were frozen during the previous five years is somewhat higher (18.5%). This, in one way, is evidence of higher downward wage rigidity in Macedonia as compared to the EU countries. Namely, 9.6% of the surveyed firms in the EU reported wage freezes. The percentage is slightly higher for non-euro area countries, where 13.4% of the firms reported wages freezes. The differences in observation periods when surveys were conducted could be one of the explanations of discrepancies of wage freezes in Macedonia and non-euro area countries.

The results in Table 4.5 show that nominal downward rigidity is markedly more widespread in the firms under review than real downward rigidity (very low 2.6%). According to the data from the surveyed firms and findings of Messina et al. (2009), the explanation for stronger downward nominal than real wage rigidity could be the dominant use of firm-level collective agreements, which allows firms to adjust wages downwards, when business cycles are negative[12]. Thus, the use of firm-level collective agreements can result in smaller real wage rigidity. Another explanation for relatively stronger downward nominal than real wage rigidity is the extent of permanent contracts[13], which are positively associated with the downward nominal wage rigidity. Also, the very low real downward wage rigidity is associated with the low automatic indexation of wages. These findings obtained from surveyed firms in Macedonia are different from those found in many EU countries, but are closer to surveyed firms outside the European monetary union. It is noteworthy that there are sizeable differences across the EU countries in the incidence of downward wage rigidity (see Babecky et al. (2009a). Overall, non-euro area countries in the sample are almost twice as likely to experience downward nominal wage rigidity compared to euro area countries, and the reverse is true for real wage rigidity.

[12] Moreover, labour market conditions in Macedonia imply relatively weak effective negotiation power from trade unions.
[13] Survey results on wage and price setting in Macedonia show that 92.4% of employees had a permanent job contract at the end of 2013.

Table 4.4
Downward nominal and real wage rigidity

	Wage freezes (downward nominal wage rigidity)	Indexation (downward real wage rigidity)
Total	18.5	2.6
Manufacturing	17	2.3
Construction	8	0.0
Trade	10	7.5
Market services	31	1.8
Very small firms	21	5.3
Small firms	23	7.5
Medium-sized firms	23	1.1
Large firms	14	4.0
Very large firms	20	1.5
Collective agreement:		
Yes	14	4.2
No	23	0.7
Memo:		
EU	9.6	17.1
Euro area	8.1	20.4
Non-euro area	13.4	8.7

Source: Survey on wage and price setting in Macedonia (2014) and Babecky et al. (2009*a*).
Results weighted by employment.

Surveyed Macedonian firms that apply collective wage agreements seem to freeze wages less often than firms which are not covered by such agreements. Moreover, the practice of cutting wages appears to be less widespread among firms that apply collective wage agreements. The survey also allows investigating the importance of various reasons preventing wage cuts. The findings obtained from our survey are in line with the EU countries and show that the two most important causes for avoiding base wage cuts were the possibility that the most productive workers would leave and the resulting reduction in work morale. The other two reasons preventing nominal wage cuts in Macedonia are the increasing costs of hiring and training new workers and the possibility of wages to become non-competitive.

Table 4.5
Main obstacles to base wage cuts
(firms answering "relevant" or "very relevant"*, percentages)

Reasons	Percent	Reasons	Percent
Wage agreements and legislation	59.5	Hiring and training costs of new workers	87.7
Impact on workers' performance	80.8	Difficulties in attracting new workers	82.6
Impact on workers' morale	89.4	Impact from unexpected changes in wages	80.2
Impact on firm's reputation	81.6	Wages may become non competitive	86.4
Risk of losing the best workers	93.0		

Source: Survey on wage and price setting in Macedonia (2014). Results weighted by employment.
*Firms were required to place a qualitative value (from not relevant to very relevant).

4.6 Alternative means to adjust labour cost

The importance of wage rigidity clearly depends on the availability of other mechanisms through which firms can reduce their labour costs without changing the base wages. The information obtained from the survey provides evidence on the relevant importance of those alternative mechanisms. These mechanisms include the possibility to reduce or eliminate bonus payments, reduce or eliminate non-pay benefits, change shift assignments or shift premia, slowdown or freeze the rate at which promotions are filled, recruit new employees at lower wage level than those who left voluntarily, and encourage early retirement to replace high wage employees with entrants with lower wages. The firms had the chance to choose more than one of these options.

The results show that around 46% of the firms have used at least one of these strategies to reduce labour costs other than reducing base wages in the recent past, and 44% have used at least one of the six margins explicitly identified in the survey. The percent of firms that use at least one strategy to reduce labour costs is higher in manufacturing, in medium-sized and larger firms and in those firms that apply collective wage agreements and exposed to more intense competition (Table 4.7). The comparative analysis shows that the percentage of firms in Macedonia that use at least one strategy to reduce labour costs is lower compared with the EU countries. This reflects labour market conditions in Macedonia, where the practice of employers is to use mostly the base wage as compensation for employees, and therefore the adjustment mechanisms such as bonuses, benefits, promotions, or early retirement[14] are used sparingly. This explanation is confirmed and

[14] For example, according to legislation, the early retirement in Macedonia is allowed, but is not paid until retired employee become 62 (for women) or 64 (for men) years old.

supported with survey results, which show that change in shift assignments, or shift premia, is the most frequent and dominantly used alternative as cost cutting strategy. Particularly, this strategy is more used in manufacturing, as this margin is more flexible in the production process and in medium-sized and larger firms. Other mechanisms used by firms when trying to reduce cost, but rarely compared with change in shift assignments, include taking longer over promotions or introducing a freeze on promotions, the use of cheaper hires to replace workers who leave the firm, and reduction of bonuses.

Table 4.6
Alternative strategies to reduce labour costs
(in percent)

	Reduce bonuses	Reduce benefits	Change shifts	Slow promotions	Cheaper hires	Early retirement	Use at least one strategy
Total	11.0	9.6	28.2	11.5	11.1	6.9	45.9
Manufacturing	18.0	17.0	40.0	18.0	15.0	12.0	62.9
Construction	1.0	1.0	3.0	4.0	1.0	0.0	7.1
Trade	4.0	6.0	18.0	7.0	4.0	2.0	27.8
Market services	7.0	2.0	23.0	6.0	12.0	2.0	42.6
Firms' size							
Very small firms	10.0	8.0	17.0	10.0	11.0	7.0	38.0
Small firms	9.0	12.0	20.0	14.0	10.0	3.0	33.0
Medium-sized firms	15.0	21.0	31.0	15.0	12.0	9.0	49.5
Large firms	18.0	14.0	25.0	17.0	13.0	11.0	46.7
Very large firms	6.0	5.0	31.0	7.0	10.0	4.0	46.3
Collective agreement:							
Yes	14.0	13.0	24.0	16.0	13.0	11.0	47.0
No	8.0	6.0	33.0	6.0	8.0	2.0	44.6
Competitive pressure:							
Severe	12.3	8.0	26.8	12.1	15.5	5.0	47.7
Strong	10.1	10.9	35.7	13.2	7.6	6.2	49.0
Weak	14.7	11.7	9.7	2.5	17.0	20.4	39.2
No competition	4.6	5.5	4.9	9.2	1.9	0.0	16.6
Memo:							
Total EU	22.8	14.8	15.7	19.7	31.8	16.0	63.1
EA	20.8	14.7	15.4	22.9	37.7	19.3	64.4
Non EA	26.7	14.9	16.3	13.4	20.7	9.7	60.4

Source: Babecky et al. (2009*b*) and Survey on wage and price setting in Macedonia (2014).
Results weighted by employment.

5. Responses to shocks

The survey also includes questions regarding the reaction of firms to three unanticipated shocks: a slowdown in demand and two supply shocks, an increase in intermediate input prices (such as the rise of crude oil prices) and a permanent increase in wages (for example, legislation that changes the required minimum wage). Firms were required to place a qualitative value (from not relevant to very relevant) on the following shock-absorbing strategies: 1. adjustment of prices, 2. reduction of profit margins, 3. reduction of output, and 4. reduction of other costs. If firms state that the cost reduction strategy is of any relevance, the options available for the responses are cutting non-labour costs or cutting labour costs (lowering base wages and flexible wage components, reduction of temporary or permanent employees, or reduction of working hours). Different shock-absorbing strategies imply different effects of these shocks with regards to price and wage setting.

Table 5.1
Adjustment strategies to shocks
(percent of firms answering relevant or very relevant)

	EU			Macedonia		
	Demand shock	Cost-push shock	Wage shock	Demand shock	Cost-push shock	Wage shock
Adjust prices	50.5	65.6	59.2	68.8	62.5	50.1
Reduce margins	56.6	53.5	49.8	56.4	54.3	40.7
Reduce output	49.9	21.4	22.5	60.5	44.6	34.1
Reduce costs	78	67.6	59	78.9	71.5	65.7

Source: WDN Final Report 2009, Survey on wage and price setting in Macedonia (2014).

The reactions of the surveyed firms to the three shocks seem to resemble those of the EU WDN survey participants (See Table 5.1). Namely, like the surveyed EU countries, majority of Macedonian firms prefer to adjust to shocks by reducing their costs. The share of firms pursuing cost reduction strategy is more dominant, of which a large share is absorbed (around 75%, Table 5.2) by reducing non-labour costs during a supply side shock, thus possibly reflecting wage stickiness. Half of the firms' pass-through wage increases to prices, which could reflect the high labour cost share (see section 6.2 below) and the moderate coverage of collective wage agreements in Macedonia.

Table 5.2

Cost adjustment after shocks (% of firms choosing the adjustment strategy)

	EU			Macedonia		
	Demand shock	Cost shock	Wage shock	Demand shock	Cost shock	Wage shock
Reduce non-labour costs	39.7	53.9	50	65.6	75.7	74.2
Adjust the amount of labour						
Reduce number of temporary/other employees	25.1	17.9	19.9	14	10	10
Reduce number of permanent employees	15.1	10.6	11.1	4.7	3.7	4.8
Reduce hours worked per employee	8.4	6.9	7.4	9.2	3.3	4.9
Adjust wages						
Reduce flexible wage components	10.5	9.5	11.6	5	6.5	6.1
Reduce base wages	1.2	1.2	-	1.4	0.8	-

Figures weghted by employment weights, rescaled excluding non-responses.

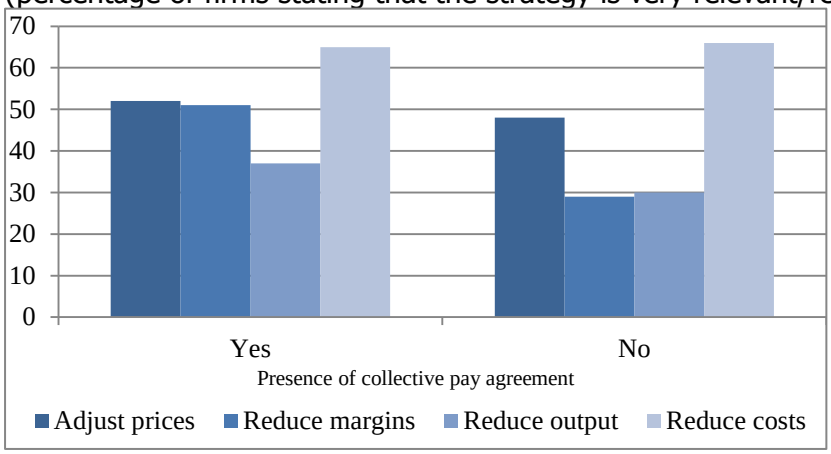
Source: WDN Final Report 2009, Survey on wage and price setting in Macedonia (2014).

Overall, among the various cost adjustment strategies, majority of firms in Macedonia, similarly to firms in the EU, prefer reducing non-labour costs as opposed to labour costs (adjusting the amount of labour or wage). However, the share of companies following this strategy in Macedonia is much larger compared to EU firms, making the amount of labour adjustment the second more preferable strategy, while willingness to adjust wages was the least favourable strategy, showing little pass-through of the shocks to employees' wages (Table 5.2). Unlike the findings of the WDN final report, about one third of the Macedonian companies (from 24% to 34%) in the survey report that they are willing to adjust the labour cost (amount of labour and wages), while in the case of the WDN EU survey, the share of firms varies from 46% to 60%. Although significantly smaller, the majority of the shock (supply and demand) is absorbed by adjusting the number of temporary employees (between 10% and 14%), while less than 5% is absorbed by reducing the number of permanent employees. These findings support the evidence of Bertola et al. (2009) and the WDN final report that the "institutional framework affects the cost cutting strategy in response to shocks," therefore as a result of rigid wages and the collective wage agreements, demand and supply shocks are absorbed by adjusting the number of temporary employees (Table 5.2). In case of a demand shock, firms are more willing to reduce hours worked than to reduce number of permanent employees. The share of the surveyed Macedonian firms willing to reduce flexible wage components during the three shocks is lower (between 5% and 6,5%) than that of the EU firms, while the Macedonian firms, same as the EU firms, very rarely cut costs by reducing base wages (below 2%).

The general finding is that the dominant and most relevant strategy of Macedonian firms when faced with different types of shocks is reduction of costs (Figure 5.1, 5.2 and

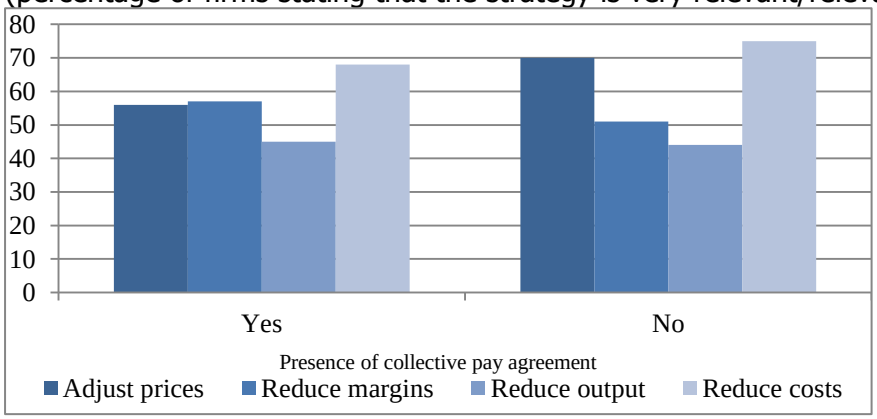
5.3). This finding holds regardless of whether employees are covered, or not, by a collective wage agreement. Differences in absorbing the shocks are more evident when firms have to resort to an alternative strategy different from cost reduction and if those firms apply collective pay agreements. Thus, when faced with the three shocks, firms with collective pay agreements are more likely to reduce profit margins or adjust prices. However, the alternative strategy of adjusting prices is more dominant (compared to profit margins and output) in firms where there is no presence of collective pay agreement. At the same, firms with collective agreements are willing to adjust output, however this strategy appears to have the least relevance compared to the previous three strategies (reduction of costs, price adjustment and profit margin reduction).

Figure 5.1
Response to wage shock
(percentage of firms stating that the strategy is very relevant/relevant)



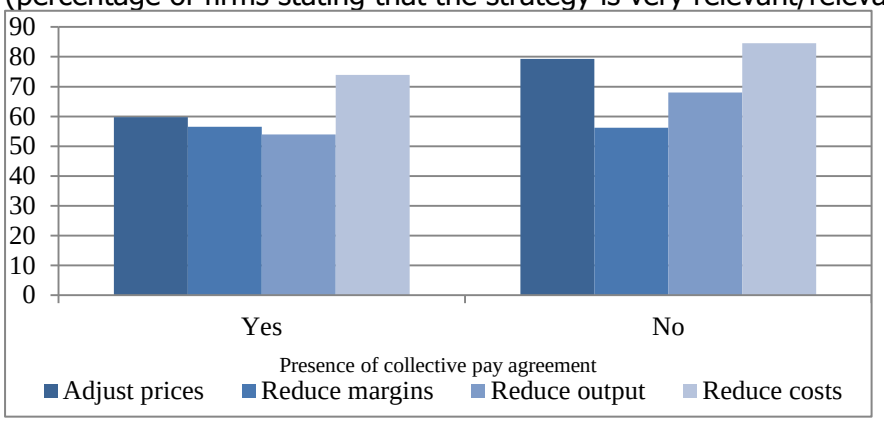
Source: Survey on wage and price setting in Macedonia (2014).

Figure 5.2
Response to intermediate cost shock
(percentage of firms stating that the strategy is very relevant/relevant)



Source: Survey on wage and price setting in Macedonia (2014).

Figure 5.3
Response to a slowdown in demand
(percentage of firms stating that the strategy is very relevant/relevant)



Source: Survey on wage and price setting in Macedonia (2014).

6. Price and wage dynamics

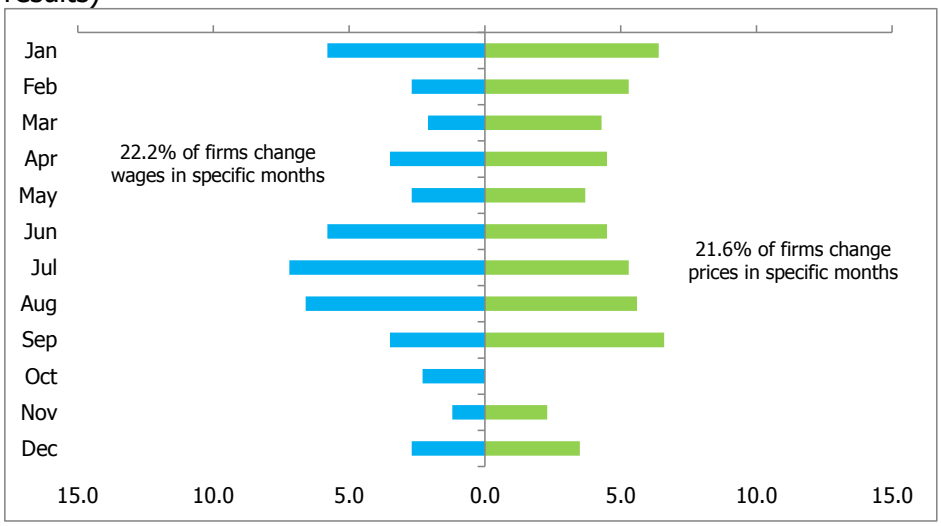
In this section, we investigate the link and interaction between wage and price dynamics. The survey questionnaire allows us to analyse the degree of concentration of wage and price changes, the possible connection between the timing of their price setting and wage setting decisions. Furthermore, we assess the relevance of the strategy of adjusting prices that surveyed firms in Macedonia use, as a response to a permanent unexpected increase in wages.

6.1. *Synchronisation of wage and price changes*

Relevant factor in the assessment of firms' flexibility when they face changes in their economic environment is the degree of synchronisation between price changes and wage changes. In order to obtain empirical evidence on this point, firms were asked whether changes to their prices occur without any defined time pattern or on the contrary, occur largely in specific months of the year. According to the information obtained, in 21.6% of firms, price changes are concentrated in specific months of the year, and among the firms in Macedonia that declare such a "time-dependent" pattern, price changes are mostly concentrated in January, August and September (Figure 6.1). As mentioned in section 4.2, firms in Macedonia were also asked whether changes to wages occurred in specific months of the year or there was no temporal pattern defined. The results show that the degree of

concentration of wage changes is quite similar to that of prices, with 22.2% of wages changed in specific months of the year. January and the months around mid-year are the months when wage and price changes are the most synchronised. Data comparisons between Macedonia and EU countries show that the degree of concentration of wage and price changes is significantly lower in Macedonia (in the EU, 54% of firms report to change wages in a particular month). The lower degree of concentration of wage changes compared to EU can be explained by considerably low automatic indexation of wages. Possible explanation of the concentration of price changes is the short price duration in the obtained results for Macedonia and large share of firms that operate in highly competitive pressures.

Figure 6.1
Concentration of price and wage setting decisions
(percentage of firms reporting to change wages/prices in a particular month; unweighted results)

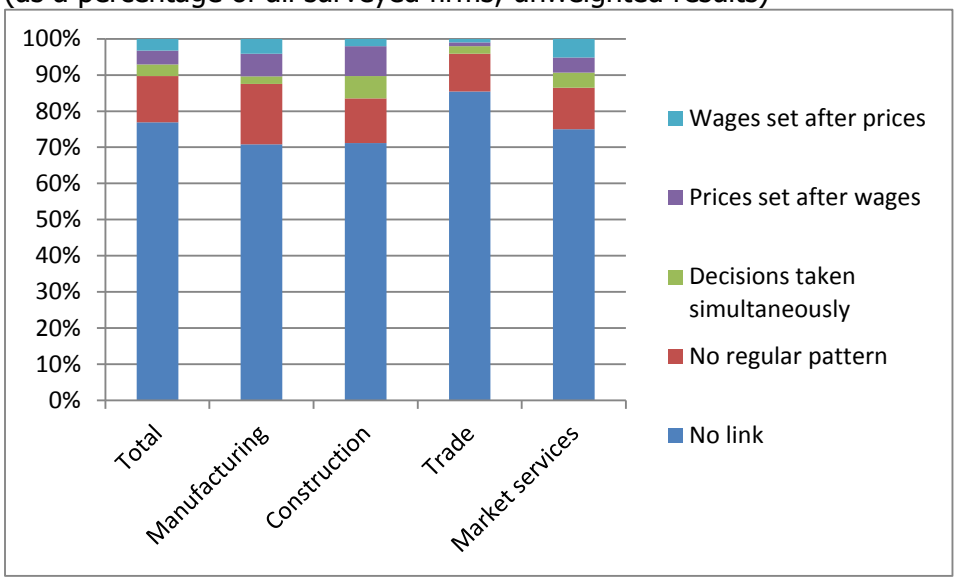


Source: Survey on wage and price setting in Macedonia (2014). The sum of percentages exceeds the proportion of firms that change wages or prices in specific months as they could choose more than one month.

The survey questionnaire also asks firms about the possible connection between the timing of their price setting and wage setting decisions. The intensity and direction of this connection is illustrated in Figure 6.2. The results suggest that there is weak degree of synchronisation between the timing of price and wage changes, with around 22% of firms in Macedonia recognizing that a connection does exist. This percent in surveyed EU countries is much higher, where 40% report synchronisation in adjustment of prices and wages. However, of 22% of Macedonian firms, only 10% admit that the link is quite strong: in 3%, the decisions are taken at the same time; in 4%, changes in prices are taken only after wages are set; and in 3%, changes in wages occur only after prices are set. In contrast, in around 74% of the firms, there does not seem to be any link between the timing of both

decisions. The weak price-wage link in Macedonia corresponds with the results that inflation is the lowest important factor driving wage changes and this is striking difference from the EU, where inflation is the main driving factor of frequent changes in wages.

Figure 6.2
Synchronisation between price and wage setting decisions
(as a percentage of all surveyed firms; unweighted results)



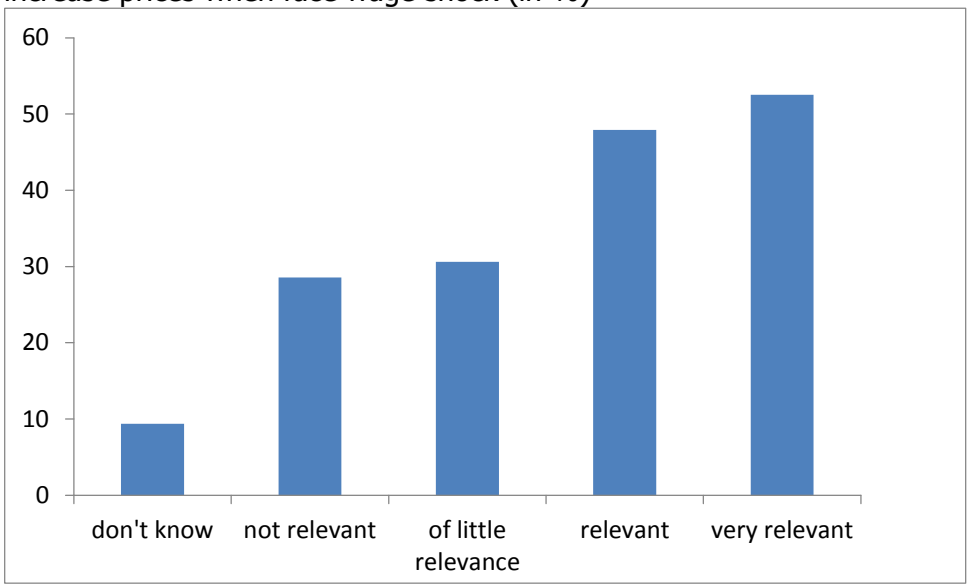
Source: Survey on wage and price setting in Macedonia (2014).

6.2. *How wages feed into prices*

The existence and extent of the pass-through of wages into prices can be gauged by analysing the strategies firms declare to implement in reaction to shocks. Indeed, when asked to assess the relevance of different adjustments strategies to a common permanent unexpected increase in wages, about half of firms reported that they would increase prices (see Table 4.1). This represents the second most relevant policy used after reduction of other costs as adjustment strategy when firms face unanticipated wage shock. Surveyed firms in Macedonia that increase prices as adjustment strategy to unexpected shock in wages have higher labour cost share (Figure 6.3). This evidence is in line with the findings of Bertola *et al*. (2009) who argue that the pass-through of wages into prices is particularly strong in firms with a high labour cost share. Survey data for Macedonia show that the extent to which wages feed into prices is related to the foreign market exposure of firms and their size. In other words, most of Macedonian firms that would increase prices when they face unanticipated wage shock belong to small-sized firms and are exposed to foreign markets. Contrary to the findings of Bertola *et al*., most of Macedonian firms that would

increase prices when they face permanent increase in wages experience severe or strong competition.

Figure 6.3
Labour cost share of firms according to their responses on relevance of the strategy to increase prices when face wage shock (in %)



Source: Survey on wage and price setting in Macedonia (2014). Figures weighted by employment weights.

7. Different channels through which the crisis affected firms' activity

The survey contains questions that aim at understanding how firms perceived the intensity of the economic downturn during the last global crisis, as well as the ways in which it was manifested. Table 7.1 summarises this information. The first block of the table gives an overview on how firms perceived the intensity of the negative demand shock, the second block provides financial constraints channel, and the last block presents firms' difficulties in being paid by customers. According to survey results, firms in Macedonia were mainly affected by a fall in demand (38.4% of firms experienced a strong or exceptionally strong decline in demand), and secondly, by difficulties in being paid by customers (37% declared strongly or exceptionally strongly), while financial constraints are slightly less important (32.4%).

Table 7.1
Intensity of crisis: Different channels through which the last global crisis affected firms' activity

	Macedonia	EA	Non EA	Total EU
	Demand fall			
None / marginal	18.4	19.3	13.7	18
Moderate	42.9	40.3	53.1	43.4
Strong	31	29.5	25.3	28.5
Exceptionally strong	7.4	10.5	7.2	9.7
Don't know	0.4	0.4	0.6	0.5
	Financial constraints			
None / marginal	26.8	52.9	40.8	50
Moderate	39.5	23.5	36.7	26.7
Strong	25.6	13.6	14.3	13.8
Exceptionally strong	6.8	5.6	5.5	5.6
Don't know	1.3	4.4	2.8	4
	Difficulty in being paid			
None / marginal	19.6	29	23	27.5
Moderate	43.2	39.5	45.4	41
Strong	22	22.2	24.1	22.7
Exceptionally strong	15	7	5.9	6.8
Don't know	0.2	2.2	1.6	2.1

Source: Survey on wage and price setting in Macedonia (2014) and WDN Final Report 2009.
Notes: The table presents the percentage of firm managers who state that demand has fallen/have faced financial constraints/difficulties in being paid by customers "not at all/marginally", "moderately", "strongly" or "exceptionally strongly". All figures are employment-weighted.

Comparing the data with the results of WDN follow-up survey for selected EU countries, having in mind the different periods of survey, the evidence for Macedonia is in line with the surveyed EU firms, which were also mainly affected by a fall in demand and by difficulties in being paid by customers.

8. Concluding remarks

This paper presents the main findings of a survey on wage and price formation in firms in Macedonia conducted in first half of 2014. The main aim was to identify some relevant characteristics about the dynamics of wages and prices in Macedonia, clarifying their interrelationship, and to draw some conclusions on firms' response to various adverse shocks in adjusting labour costs, prices and their various components. A deeper knowledge of wage dynamics is essential for better understanding the determinants of prices. Additionally, wage flexibility is an important requirement for providing an adequate adjustment to different shocks in the economy.

Firms in Macedonia are characterised by a low degree of wage indexation, a moderate coverage of collective wage agreements, with labour intensive production process, a high proportion of low skilled blue-collar workers and with limited use of flexible wage. Wages tend to remain unchanged on average for almost 16 months, which is somewhat longer compared with the average wage duration in surveyed EU countries (15 months), as a result of lower indexation scheme to inflation and still moderate coverage at sector- or firm-level collective wage agreement. Prices tend to remain unchanged for only 7 months, due to the high share of firms that experience severe or strong price competition. It can be seen that changes in wages occur less frequently than changes in prices, thus the average duration of wages is considerable 9 months longer than the average duration of prices. Tenure stands out as the most important factor producing wage adjustment, while the frequency of wage changes driven due to inflation is the lowest. The degree of time concentration of wage and price changes is significantly lower in Macedonia than in the surveyed EU countries and can be explained by considerably low automatic indexation of wages and large share of firms that operate in highly price competitive pressures.

Downward nominal wage rigidity is more important compared to downward real wage rigidity. This is also true for the surveyed non-euro area countries. Compared to the figures of the surveyed EU firms, downward nominal wage rigidity is higher, while downward real wage rigidity is more modest in Macedonia. Explanation for stronger downward nominal than real wage rigidity in the case of Macedonian firms is the extent of permanent contracts, which are positively associated with downward nominal wage rigidity, and the dominant use of firm-level collective agreements, which has a negative impact on real wage rigidity.

The reactions of the surveyed firms to shocks seem to resemble those of the EU WDN survey participants. Namely, same as the surveyed EU countries, majority of Macedonian firms prefer to adjust to shocks by reducing their costs, mainly by non-labour cost reductions. After this strategy, the second most popular adjustment strategy is price adjustment.

There is a weak degree of synchronisation between the timing of price and wage changes, with only 22% of firms recognizing that a relationship does exist (40% in the surveyed EU countries). The weak price-wage link in Macedonia corresponds with the results that show that inflation is the lowest important factor driving wage changes and this is striking difference from the EU, where inflation is the main driving factor of frequent

changes in wages (although in both cases, in general, there is low-inflation environment). However, the pass-through from wages to prices observed after an unexpected wage shock appears to be relevant for half of the surveyed firms in Macedonia.

In this paper, the analysis of survey results is focused only at a descriptive level. We tried to link and cross-tabulate some answers of firms about wage and price setting with their sector, size, market competition, collective agreement, labour cost share, in order to explain some behaviour of firms related with their wage and price decisions. In order to quantify the relationships of firms' characteristics with their wage and price decisions or to explain their behaviour when they face unanticipated demand and/or cost push shock, our analysis needs to be presented in multivariate framework. The issues identified at a descriptive level will be our point of interests of such quantitative analysis and will provide robustness of findings in this phase. Analysis of wage and price setting survey results in multivariate framework will follow in the next period. Empirical research work in this context using Macedonian survey data is done by Huber & Petrovska (2015).

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